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AUTHOR Boylan, Hunter R., Ed.; Kerstiens, Gene, Ed.
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ABSTRACT

These five issues of "Research in Developmental Education," examine the theoretical models and foundations of developmental education. Included are the following: (1) "Theoretical Foundations of Developmental Education," by Hunter R. Boylan, which examines the behaviorist, humanist, and developmental theories underpinning developmental education; (2) "Models of Student Development, Parts I and II" by Boylan, which examine Erikson's Eight Stages of Man and reviews the implications of this human development model for developmental educators; and discuss Chickering's Seven Vectors of Student Development as well as the ways in which those vectors affect students; (3) "A Cognitive Approach to Issues in Developmental Education," by M. Jan Mickler, which examines and critiques cognitive models of learning, including the factorial, developmental stage, heuristic, taxonomic, and integrative models; the article includes an 83-item bibliography; and (4) "Affective and Cognitive Features of Collaborative Learning," by Kate E. Sandberg, which reviews collaborative and cooperative learning theories, describes an integrated model combining elements of both learning strategies, and describes the benefits of this model for students. (PAA)

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Research In Developmental Education

Hunter R. Boylan, Editor

Theoretical Foundations of Developmental Education

By: Hunter R. Boylan

Professionals in the field of developmental education often fail to notice that what they practice is based on some sort of theory even if they are unable to describe the particular theoretical base from which they work. Nevertheless, there are a number of theoretical approaches to learning that have relevance for developmental education. In fact, developmental education as we know it would be impossible were it not for these theoretical approaches.

Those who work in remedial, developmental or learning assistance programs should bear in mind that developmental education is not only a field of practice, it is also a field of inquiry. A part of this inquiry is the exploration of research and literature to generate knowledge which informs practice. Theories of learning form a basic part of the knowledge base which informs the practice of developmental education.

This issue of **Research in Developmental Education**, therefore is devoted to a review of the major families of theory which have influenced the field of developmental education. These families of theory include the behaviorist, humanist, and developmental approaches to learning. Although these theories come from fields outside developmental education (such as psychology, philosophy, sociology, and student personnel), they still form the basis for program design and practice within the field of developmental education. They provide the knowledge base that we use in determining learning prescriptions for students, and they offer guidelines for the organization and delivery of our services.

Behaviorist Theories

Of all the current theories of learning, the behavorist family of theory is probably the oldest and most influential. While behaviorism has its roots in the early work of Pavlov (1927) and Thorndike (1898), the best known modern behaviorist is B. F. Skinner. Skinner's work **Science and Human Behavior** (1953), has been particularly influential in the past 30 years. Holland and Skinner's programmed text, **The Analysis of Behavior** (1961) was a major impetus to the programmed-instruction movement of the 1960s. Programmed instruction was one of the first truly individualized learning approaches to be adopted in postsecondary education, and the programmed-instruction movement still dominates much of the thinking and practice in the area of individualized learning.

The basic assumption underlying behaviorist theories of learning is that people respond to external variables in the environment. These variables stimulate individuals to act in different ways. Through manipulating these variables to

provide either positive or negative reinforcement, teachers may stimulate the desired learning behaviors.

The basic assumptions in behaviorist theories and the major authors who have contributed to these theories are summarized in TABLE I.

Behaviorist theories of learning usually emphasize the following characteristics:

1. clear statements of specific and measureable objectives;

2. carefully designed sequencing in the presentation of materials;

3. small content units that must be mastered before moving on to the next unit;

4. immediate feedback to students regarding the correctness or incorrectness of their responses; and

5. emphasis on the learning material as a major stimulus to learning, as opposed to emphasis on the role of teachers or tutors.

These essential characteristics of behaviorism have formed the basis for several systems of instruction in addition to programmed learning. One of the best known and widely disseminated of these instructional systems is the Keller Plan or the Personalized System of Instruction (PSI). Developed originally by Fred S. Keller (1968), PSI stresses the use of written materials to guide learning, individual tutoring by proctors, small-unit testing, student self-pacing, and the use of lectures to motivate students rather than to provide essential course information.

Of all the theoretical models for learning, the behaviorist model is the most researched. A substantial body of evidence exists to suggest that the use of behaviorist techniques can be very helpful in designing successful learning experiences in a variety of settings. Remedial and developmental programs are no exception to this. In fact, most remedial or developmental programs use several different behaviorist approaches through the provision of programmed instruction, computer-assisted instruction, and an emphasis on written study guides and mastery learning.

Humanist Theories

Both behaviorist and humanist theories assume that the environment has an important impact on learning. Humanistic theories, however, place emphasis on creating an environment where learning will take place naturally rather than on manipulating variables in the environment to provide reinforcement.

Carl Rogers, through his works **Client-Centered Therapy** (1951) and **On Becoming a Person** (1961), articulated the major theoretical framework for the humanist view of learning. The basic concepts of the humanist model and a listing of some of the major authors in this area is provided in TABLE II.

The humanist assumes that people are naturally and intrinsically motivated to learn as part of the human need for personal growth and development. Given this, the major role of teachers is to provide nourishing and supportive environments that will stimulate this natural learning tendency. The teacher who uses a humanistic approach becomes a manager of environments rather than a manipulator of rewards and punishments.

According to Cross (1981), "Implementing humanistic theory... would mean providing multiple options of people, resources, and materials; making them freely available... helping learners to think through what they want to learn and how they want to learn it; and making few value judgements about the nature or quality of the learning experiences" (p. 228).

Few developmental programs actually utilize a completely humanistic approach in the design and delivery of services. The humanistic approach has been more useful to developmental educators as a philosophical framework than as an instructional tool.

This is probably a result of the fact that few developmental students - particularly the younger ones - are prepared to accept responsibility for their own learning. Generally, developmental students

require more structure for learning, at least initially, than is provided by the humanistic approach. Until such time as developmental students are able to engage in independent study, discipine themselves to academic work and monitor their own learning, they are not good candidates for the application of humanistic learning procedures. The development of such discilpine and personal monitoring ability among underprepared students is nevertheless one of the major goals of most developmental programs.

Adult developmental students may, however, represent an exception to this rule. Tough (1978), in his review of adult learning activities, has found a great deal of evidence that older adults are truly self-directed learners and that they learn effectively in programs based on humanistic concepts. For developmental programs with large numbers of adult learners, therefore, the humanistic approach may be more effective than other approaches.

Developmental Theories

The very concept of developmental education is rooted in developmental theory. All developmental theories hold that

TABLE I

Behaviorist Theories and Concepts

Major Theorists	Concepts	Terms
B. F. Skinner Fred S. Keller J. B. Carroll B. S. Bloom	The focus of learning activities should be on student behavior and the manipulation of external rewards and punishments to obtain the desired behavior.	Conditioning Programmed Learning Behavior Modification

TABLE II

Humanist Theories and Concepts

Major Theorists	Concepts	Terms
Carl Rogers Allen Tough Abraham Maslow	There is a natural tendency for human beings to want to learn and learning is best facilitated by providing warm, encouraging and supportive environments in which learning will naturally take place	Self-Actualiztion Self-Directed Learning Client-Centered

learning is a process wherein students move from one level of knowledge to some other level. The basic maxim of developmental education -- "take students where they are and move them as far as possible" -- is a cornerstone of developmental theory. A major assumption of developmental theory is that individuals differ in their levels of development, and growth and learning can only take place as a result of accepting a student's current level of development and working from there.

Developmentalists disagree over the extent to which environment influences growth. Some developmental theorists, like Perry, see growth as taking place through a fixed series of stages. Others, like Chickering, see students as "developmentally diverse," meaning that they may progress through different stages at different times. A listing of the major developmental theorists along with the terms and concepts associated with developmental theories is provided in TABLE III.

Developmentalists, like humanists, consider it important for learning environments to be warm, supportive, and encouraging while filled with a variety of resources for growth. Unlike the humanists, the developmentalists believe that teachers must take an active role in manipulating environments. Rather than manipulating rewards and punishments, as the behaviorists would suggest, the developmentalists see the teacher's role as providing the challenges necessary to stimulate growth.

In general, the major characteristics of most developmental theories include the following:

1. growth and learning takes place in stages;

2. each stage of development is an integrated whole;

3. as individuals pass from one level of development to another, all previous stages are integrated into the next; and

4. each individual develops in a direction and at a rate that is unique.

It should not be surprising that the developmental approach is the one most frequently encountered in developmental programs. The developmental philosophy usually pervades the design and organization of most programs, even if the deli-

TABLE III

Developmental Theories and Concepts

Major Theorists	Major Concepts	Terms
Arthur Chickering Erik Erickson Jane Loevinger Lawrence Kohlberg William Perry, Jr.	There are various stages or tasks that individuals must complete in order to grow and develop. In most cases, individuals must pass from one stage to another in the process of growth and learning. Environments and actions in those environments may either foster or retard this growth.	Developmental Stages Developmental Tasks Levels of Readiness

very of services is based on behaviorist principles.

Summary and Comments

All the families of theory described here have a place in the field of developmental education. The humanist approach, with its emphasis on the worth of individuals and the natural desire of individuals to learn, has heavily influenced the basic philosophy of the field of developmental education. The field is, after all, committed to the notion that everyone has a right to advance themselves through learning and that an underprepared student is as worthwhile and deserving of support as a well-prepared student.

In terms of actual program operations, both the behaviorist and the developmentalist theories have been very influential. Programs are usually designed on the basis of developmentalist assumptions. Specifically, students are accepted with whatever level of skills they possess, and their skills are developed through a series of tasks or challenges designed to foster progressive growth. At each stage of the process, students are expected to integrate prior knowledge and development into the next stage.

For instance, a student is not expected to master algebra until he or she has developed arithmetic skills. Once these skills are developed, however, students are expected to integrate them into their learning behaviors in algebra. Throughout the process of developmental education, there is a recognition that each student will develop individually, and there is a respect for the individual's level of development. Nevertheless, there is also an expectation that such development will, indeed, take place.

While this developmental approach may be a major factor in the design of developmental programs, the behaviorist approach often influences the actual delivery of services. Developmental courses are frequently taught, at least in part, according to behaviorist principles incorporated in most individualized instructional systems. Individualized, or self-learning materials, often used in developmental programs, also frequently incorporate behaviorist principles such as an emphasis on clarity of objectives, a mastery orientation, and the use of immediate feedback techniques.

It is clear, then that the field of developmental education borrows heavily from a variety of theoretical foundations to learning. It is, perhaps, this diversity of theoretical approaches, incorporated into well-integrated programs that enables developmental educators to improve learning where others may have failed.

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Research In Developmental Education

Hunter R. Boylan, Editor

Models of Student Development
Part I

By Hunter R. Boylan

The very name of our field, "developmental education," suggests that we are concerned with the development of students. In fact, a basic maxim of the field is that we take students where they are and encourage them to develop as far as they can. For the most part, however, our efforts to promote student development are directed toward basic skills development. Those efforts are seldom directed toward students' personal development.

As used here, personal development refers to the process of becoming increasingly complex and sophisticated in one's thoughts, feelings, and actions. As Sanford points out, "Growth may be defined as expansion of personality - the addition of parts and the enlargement of existing parts." On the other hand, "Development means, most essentially, the organization of increasing complexity" (1969, p.47). This increased complexity in perceiving and dealing with the world around us is a major outcome of the adult development process. As the process continues, adolescents and adults become more sophisticated in their personal views and interactions with others. They develop better self-concepts and an improved sense of identity. They are also better able to cope with their own feelings and problems as well as with the world around them.

Such development is particularly important for developmental students. There is a substantial body of research suggesting that the more students develop, the better they will perform academically and the more likely they will be to persist in college (Cross, 1976; Roueche & Snow, 1977; and Chickering, et al., 1981). It would appear, therefore, that the best combination of treatments for developmental students would include academic skills development activities as well as personal development activities.

Developmental programs often do an excellent job of improving students' basic academic skills. They have proven to be successful in developing students' reading, writing, and mathematics abilities and enabling them to perform well in the regular college curriculum.

On the other hand, most developmental programs' efforts to encourage students' personal development are limited. They often consist only of individual counseling by peers or professional staff. This counseling is usually problem-centered; it is designed to help students cope with specific personal or academic difficulties. It is seldom based on any particular theory of student development. The counseling that usually takes place in developmental programs tends to be "crisis oriented" rather than preventive. It also tends to be random rather than systematic.

As a result, whatever personal development that takes place among students is usually due to maturation rather than program intervention. Yet there are a wide variety of theory-based intervention activities that can be useful in promoting student development. It would be useful, therefore, if developmental educators were aware of student development theories and some of the implications of these theories for the practice of student developmental education.

During the past two decades, a number of theories of student development have been generated. William Perry and Lawrence Kohlberg are, perhaps, best known for their theories of intellectual and moral development. Another set of theorists, Arthur Chickering and Erik Erikson, are best known for their work in the area of personal development. This issue of RESEARCH in DEVELOPMENTAL EDUCATION is devoted to a discussion of the developmental theory of Erik Erikson and its implications for developmental educators.

Erik Erikson and "Ego Epigenesis"

Although Erikson was originally trained in Freudian psychoanalysis, his theory of development departs from the classical Freudian position in two ways. First, Erikson believes that ego development is not an entirely internal process. Instead, he postulates that the ego develops as a result of interactions between the individual and the environment. A second departure from classical Freudianism is Erikson's emphasis on the positive

adaptive capacity of individuals. Erikson's writings incorporate a number of humanistic notions regarding the innate capacity of human beings for growth and development.

Erikson's basic assumption is that human development results from the emergence of the ego as an agency for integrating the inner self with society. In Erikson's words, the ego acts to "...bridge one's inner life and social roles" (Erikson, 1964, p. 148). This integration process results in the development of a personal identity -- an organized set of self-images that determine who we are.

Erikson proposes that the ego develops as a result of some interaction between an individual's physical stage, the individual's experiences and roles in society, and the way in which these experiences are internally integrated. An adolescent, for instance, is going through a particular physical stage in which he or she experiences physical growth, new emotions, and hormonal changes.

At the same time, the adolescent is playing a variety of new roles in society. The way in which these physical and role changes are perceived and processed influence the way in which ego and identity are developed. The adolescent assigns some meaning to these experiences and approaches life on the basis of this internal ordering of events and meanings. For Erikson, therefore, ego development is a psychosocial process involving interaction between the individual and his or her environment.

According to Erikson's model, individuals go through eight stages in psychosocial development. These stages are summarized in TABLE I.

The earliest of Erikson's stages (stages one through four) have to do with gaining understanding and control over bodily functions and emotions. The later stages (five through eight) are involved in gaining self-understanding and control over one's environment.

Each of these stages represents a particular point in the life cycle when physical and intellectual development take place in conjunction with certain social roles. This convergence of physical, intellectual, and social processes brings about a crisis that requires resolution. These crises arise at relatively predictable points in the human life cycle.

The resolutions of these crises are referred to by Erikson as "developmental tasks." The extent to which these developmental tasks are successfully faced determines what Erikson calls a "polar orientation." The lessons learned as a result of crises and development in a particular stage result in certain attitudes toward self and society which form a background for further development. As a result, polar orientations may be positive or negative, and they may influence further development in a beneficial or in a harmful manner.

According to Erikson, this process of physical, social, and emotional integration completed in each developmental stage is on-going throughout life. Only the stages and the life crises change.

Implications of Erikson's Theory

Although Erikson does not provide any specific guidance as to how his theory should influence practice, other researchers have attempted to provide such guidelines. Kenniston (1971), for instance, points out that since college students are generally between 18 and 30 years old, most of them will be dealing with crises involving identity.

As Sanford notes (1969), human growth usually requires the combination of challenge and response. Challenges require individuals to take actions. The result of these actions determine the extent to which individuals view themselves as competent and able to deal with the world around them.

For the developmental educator, therefore, primary attention should be paid to the manipulation and "fine tuning" of challenges. The aim of this manipulation and fine tuning should be consistent with

TABLE I *

Erikson's Eight Stages of Man

	STAGE	NATURE OF CRISIS
One:	Oral Sensory	Basic Trust vs. Basic Mistrust
Two:	Muscular - Anal	Autonomy vs. Shame and Doubt
Three:	Ambulatory - Genital	Initiative vs. Guilt
Four:	Latency	Industry vs. Inferiority
Five:	Youth, Puberty, and Adolescence	Indentity vs. Role Confusion
Six:	Young Adulthood	Intimacy vs. Isolation
Seven:	Adulthood	Generativity vs. Stagnation
Eight:	Maturity	Ego Integrity vs. Despair

*Adapted from Miller and Prince, 1976

the developmental tasks that students are likely to be facing.

Knefelkamp (1978) suggests that ego/identity development requires that students deal with real problems and significant outcomes rather than academic "busywork." Involvement in academic as well as student activities should, therefore, be meaningful in some real-life context. This notion is consistent with Canfield's admonition that instructional objectives should always be based on rationales that are meaningful to students (1981).

One of the major tasks that students will be engaged in during their college years is that of developing an identity. This is true even of older students. Generally, the older non-traditional student is returning to college because of some dislocation in that student's life experience. Displaced homemakers, unemployed workers, or late-career-seeking individuals may have had a solid identity at one point, but the changes in their lives may also cause them to question this identity. Younger as well as older students may be quite vulnerable during their college years. Traditional-age students are in the process of developing a self-concept and an ego identity, and older students are in the process of revising their self-concepts and identities. A bad academic experience, a failing grade, or an unmanageable task may have a serious impact on this process of developing or re-establishing identity.

Developmental educators, therefore, must carefully plan academic, intellectual, and social experiences to insure that every opportunity exists for positive rather than negative learning. As Keimig (1983, p. 47) points out, "Poor academic self image is a cause of failure in college." One reason for this is that a prior identity of academic failure often characterizes developmental students. Even for those students who do not have a "failure identity," there is the possibility that bad academic experiences will cause them to develop such an identity.

Developmental educators must not only strive to overcome this prior identity but also help students to develop a "success identity." This can be accomplished through the following:

1. insuring that assigned tasks are sufficiently manageable that students have a reasonable probability of success;

2. designing tasks as assignments in such a way as to insure that they are sufficiently challenging to provide a sense of accomplishment;

3. providing positive, supportive feedback encouraging students to continue their efforts while making necessary adjustments in their approaches to study, test taking, class participation, and other academic tasks;

4. offering supportive guidance to help students adjust their behavior so that they can become more successful academically;

5. providing in the classroom social experiences that enable students to interact with one another in a meaningful fashion, and;

6. teaching in such a way as to respect individual rates and styles of learning.

If developmental educators can emphasize these things in their classrooms as well as personal interactions with students, they can facilitate student personal development as well as academic development. This personal development will, in the long run, contribute as much to academic success and the building of basic skills in the content areas.

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NOTE: The next issue of RESEARCH IN DEVELOPMENTAL EDUCATION will address Chickering's model of student development and its implications for developmental education.

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Edited By Dr. Hunter R. Boylan

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Research In Developmental Education

Hunter R. Boylan, Editor

Models of Student Development

Part II

By Hunter R. Boylan

The last issue of *RESEARCH IN DEVELOPMENTAL EDUCATION* explored Erik Erikson's model of human development and its emphasis on the psycho-social nature of ego growth. Erikson is one of several human development theorists who emphasizes the interaction between individuals and their environments as a major force in human development. Another human development theorist who takes this view is Arthur Chickering. Chickering is best known for his classic work, *Education and Identity* (1969), in which he articulated his model of "vectors of student development." This book and his later work, *"The Modern American College* (1981), have provided a major theoretical and practical foundation for the field of college student personnel work.

Chickering's model has been criticized because some of his seven vectors lack precise definition. Also, the process of change within each vector is not clearly articulated. Nevertheless, Chickering's model represents one of the more practical approaches to student development. It has a number of practical implications for anyone who works with college students--particularly developmental educators. This issue of *RESEARCH IN DEVELOPMENTAL EDUCATION*, therefore, is devoted to a review of Chickering's seven vectors of student development.

The Developmental Process

Chickering draws many of his ideas from the work of Erikson (1968). Like Erikson, he believes that development takes place as a result of interaction between individuals, environments, and society. Unlike many developmental theorists, however, he does not believe that development takes place according to some fixed sequence of stages. Instead, he contends that students are "developmentally diverse." By this, he means that in any group of students of a similar age there will be displayed considerable diversity in levels of development.

In Chickering's view, development takes place as a result of continuing cycles of differentiation and integration. In developing through each of the seven vectors, individuals perceive themselves and their environment as increasingly more complex. They then organize this complexity into some personal, integrated meaning.

A developmental student may, for instance, see himself initially as simply a poor scholar. In this sense, he differentiates between his scholastic ability and his other attributes. He also sees scholastic ability as some sort of whole without any parts. As he develops, the student learns that he may be a poor writer but a good speller or poor in mathematics but good with oral presentations. In other words, the student eventually sees himself as having a variety of attributes that make up scholastic ability. Furthermore, these attributes are eventually seen as parts of the whole personality. As these attributes are seen as a part of the student's whole self, they become part of the student's personal identity.

Chickering contends that development takes place through this process of 1) awareness of increased complexity, 2) differentiation of parts from the whole, and 3) reintegration of these parts into the identity. It is through this process that individuals grow toward self-realization and maturity.

Of course, this process doesn't take place automatically. Chickering believes that the process of growth is

governed by factors such as the challenges students face, their response to these challenges, the outcomes of these challenges, and students' perceptions of these outcomes. Development can, therefore, be encouraged by careful arrangement and management of the challenges faced by students. If the challenges involved in the collegiate experience are overwhelming, growth will be stifled. If the challenges are manageable, yet sufficiently difficult to provide a feeling of accomplishment, students are likely to develop positively.

Although developmental theorists differ in their approaches, most would agree with Chickering that this process of facing and responding to challenges is an important part of human development. As a result, one major implication of Chickering's work, as well as other models of human development, is that those who work with students have a responsibility to manipulate challenges in such a way as to promote student growth.

Vectors of Student Development

A summary of Chickering's seven vectors is provided in TABLE I. These vectors are explained in some detail below.

Chickering's first vector is that of **developing competence.** This vector represents one of the primary tasks of young adulthood. It refers to the development of a personal belief that one has the intellectual, manual, and social skills necessary to accomplish one's objectives.

The second vector is that of **managing emotions.** Development in this vector requires the recognition and understanding of one's own feelings. Once this recognition and understanding are attained, one can express and control these feelings with some flexibility.

The third vector is that of **developing autonomy.** This vector involves the development of personal and emotional independence and a recognition that one is in control of his or her own destiny, but also the recognition that human beings are legitimately interdependent as well as independent.

TABLE I

Chickering's Seven Vectors of Student Development

Vector 1 -	**Developing Competence**
Vector 2 -	**Managing Emotions**
Vector 3 -	**Developing Autonomy**
Vector 4 -	**Establishing Identity**
Vector 5 -	**Freeing Interpersonal Relationships**
Vector 6 -	**Developing Purpose**
Vector 7 -	**Developing Integrity**

The fourth vector is that of **establishing identity.** Although Chickering places this vector fourth on his list, he also regards it as the sum and total of development in all vectors. He proposes, however, that before an individual's personal identity can be developed, the individual must at least have developed feelings of competence and autonomy and learned to manage emotions. Briefly stated, establishing identity involves the development of a realistic picture of oneself as a complete and unique entity.

The fifth vector is that of **freeing interpersonal relationships.** This refers to an individual's ability to develop mature interpersonal relationships characterized by increased tolerance and acceptance of differences. This eventually leads to an ability to have empathy for others.

The sixth vector is that of **developing purpose.** Purpose, as used here, refers to a sense of one's personal, career, and lifestyle interests and a commitment to pursue those interests.

The last vector is that of **developing integrity.** This refers to the development of a sense of values or a personal operational code that guides one's actions. A major task of young adults is to define their beliefs and then to bring their actions into line with these beliefs.

While these vectors were originally designed to describe early adult development which occurs somewhere in the age range of 18 to 25, the process of development continues well past the early adult years. In many respects, it is a continuous process. It is also a changing process. The 45-year-old auto worker, for instance, may feel completely competent and autonomous until he loses his job. If he is out of work for any length of time, he is likely to have trouble maintaining his sense of autonomy. If he takes a new job later, he will have to develop his sense of competence anew.

The process of development is on-going and that process, even in older adults, often takes place according to the vectors described by Chickering. It is a process that all adults and, therefore, all of our students are going through while they are attending our classes, obtaining our counseling, or using our tutors.

Conditions of Impact

One of the things that has made Chickering's work so popular among student personnel practitioners is that he not only proposes a model of adult development, he also stipulates a number of conditions that influence development. These **conditions of impact,** as Chickering calls them, have direct implications for anyone who works with college students.

These conditions of impact are summarized in TABLE II. Of these, the ones of greatest importance to developmental educators are **Clarity and Consistency of Objectives** and **Curriculum, Teaching and Evaluation.**

Donovan (1975) found that the most successful developmental programs were the ones where program objectives were clear to everyone and where these objectives were taken seriously. Chickering (1981) contends that development is encouraged when faculty and staff act in ways that are consistent with program objectives and encourage students to do likewise.

TABLE II

CHICKERING'S CONDITIONS OF IMPACT

Clarity and Consistency of Objectives

Development is encouraged when institutional and program objectives are clearly defined and articulated and when they are taken seriously by college personnel.

Institutional Size

Development is encouraged when the number of students in a given setting is roughly equal to the number of opportunities for active participation and satisfying experiences.

Curriculum, Teaching and Evaluation

Development is encouraged when there are a variety of course options and electives, when there is diversity in teachng methods and styles, and when there is frequent evaluation and feedback available to students.

Residence Hall Arrangements

Development is encouraged when there are opportunities to develop social and personal skills, to interact significantly with others, and to take part in the design and delivery of activities and programs.

Faculty and Staff

Development is encouraged when there is frequent student-faculty interaction, when that interaction is friendly and supportive, and when institutional administrators encourage such interactions.

Student Culture

Development is encouraged when the student culture of an institution is diverse, yet accepting...when diversity of attitudes, interests, and values is tolerated and promoted.

Developmental programs, courses, and other activities, therefore, should have a clear statement of objectives, and these should be completely understood by everyone involved in these programs. Under these circumstances, students are able to develop a sense of autonomy because they know exactly what the rules and expectations are in a given situation. As a result, they are better able to see the links between their behaviors and the outcomes.

Under the heading of **Curriculum, Teaching and Evaluation,** developmental educators should be concerned with things such as variety and flexibility in the basic-skills curriculum. There should be several levels and types of basic skills courses, and students should be involved in the process of selecting from among a varied menu of courses. Within each course, a variety of learning methods should be employed. Furthermore, there should be ample opportunity for students to have their work evaluated and to receive feedback on the basis of this evaluation. The availability of choices encourages the belief among students that they do have some control over their lives and that they can exercise autonomy. Evaluation and feedback help students to develop a sense of competence.

As noted in the last issue of *RIDE*, promoting student development isn't something to be done just because it makes students feel better. It is something to be done because it helps them become better students. To the extent that underprepared students develop feelings of autonomy, competence, and can establish an academic identity, they will also be much more successful academically.

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Edited By Dr. Hunter R. Boylan

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REVIEW OF
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A Cognitive Approach to Issues in Developmental Education

by M. Jan Mickler

The purpose of this review is to organize and analyze selected published literature relative to those instructional systems associated with developmental education. Three related topics will structure this discussion. First, five theoretical models of learning and instruction will be reviewed and related to those instructional approaches that generally characterize developmental educational programs. A second focus will consist of a selected critique of these models in light of recent findings from the cognitive and sociolinguistic literature of interactive variables that characterize learning environments. The final section applies these findings to developmental education practice.

Cognitive Models of Learning

The grouping of cognitive theories into categorical models is problematic because of the complex array of interactive constructs that are often difficult to define and view clearly as discrete entities. Because of this complexity, many varying categories have been used to group and label theories and philosophies of learning. The following five categories represent a synthesis of theoretical and philosophical viewpoints found in recent cognitive and sociolinguistic literature (Chance, 1986; Chipman, Segal, & Glaser, 1985; Frederiksen, 1984; Nickerson, 1981, 1984; Nickerson, Perkins, & Smith, 1985; Resnick, 1987; Segal, Chipman, & Glaser, 1985; Sternberg, 1985, 1986b; Wagner & Sternberg, 1984; Wittrock, 1986).

The Factorial Model

According to Wagner and Sternberg (1984), the factorial view of learning is based on work of early psychometric theorists who searched for those mental abilities that account for intelligence and learning. The identification of these intellectual factors came from studies in which the sources of variation among people were identified and labeled as components of intelligence. Learning success was viewed as being clearly related to the abundance of these relatively stable factors, variously labeled as verbal and analytical, comprehension and fluency, spatial awareness, memory, perceptual speed, pattern perception, and reasoning. The primary instructional application is to give learners practice activities to exercise and strengthen these factorial abilities with the assumption that the new or improved skills would transfer and be applied to other learning contents.

One instructional approach involves learners in developing a proficiency in those tasks commonly found on standardized intelligence tests such as spatial reasoning, vocabulary-building, analogies, perceptual and aural discrimination, and analytical reasoning. Sternberg's (1986b) program, for example, is a year-long college course based on his triarchic theory of human intelligence (Sternberg, 1984a, 1984b). The course includes a wide array of practical and academic problems designed to help students develop the "elementary" information processes that underlie latent abilities measured by IQ tests and real world performance. In addition, students are presented with methods for overcoming emotional blocks that inhibit learning. A similar course (Whimbey & Lockhead, 1980, 1984) presents students with problem solving activities that require the analytical thinking believed to underlie learning-based intellectual abilities. Students are taught a technique called paired problem solving in which they alternate between being the problem solver and being the listener. Four types of problems (verbal reasoning, analogies, trend analysis, and mathematical word problems) are used to teach students to analyze and potentially avoid four kinds of mistakes associated with learning difficulties (failure to use all the relevant facts, failure to use a systematic approach, failure to withhold judgment, and failure to correctly represent the problem).

A second factorial instructional approach is to diagnose and remediate those defective or underdeveloped abilities assumed to underlie sources of difficulty with learning. Two examples of this approach are Instrumental Enrichment (IE) (Feuerstein,

Rand, Hoffman, & Miller, 1980) and The Structure of the Intellect (SOI) (Meeker, 1969). Both focus on the remediation and correction of cognitive deficits that are hypothetically linked to unsuccessful learning. The goal of the IE program is to develop three categories of cognitive abilities that underlie learning and decision making. "Input" abilities are those that underlie the perception of environmental stimuli; "elaboration" abilities are those mental processes that involve the integration of perceived phenomena; "output" abilities are those behavioral and communicative processes that signal the presence of learning. Students are given paper and pencil exercises designed to enhance planning, organizing, recognizing relationships, orientation in space, classifying and comparing, following directions, logical reasoning, synthesizing, analyzing, and inductive and deductive reasoning. One lesson in categorization, for example, requires that students be shown pictures of common objects and be asked to identify each. They are then asked to list those objects that belong to categories characterized by specific attributes. Students attend sessions two to three hours per week for several years.

Based on the work of Guilford (1967), the SOI program contains paper and pencil activities designed to strengthen three related dimensions of intellectual dysfunctioning: operations, contents, and products. The operations dimensions are those cognitive factors required for comprehension, memory, problem solving, and evaluation. The contents dimensions are those behavioral, figural, symbolic, and semantic representations that are constructed by operations abilities. The products are informational units, classes, relations, transformations, systems, and extrapolations that organize and categorize substantial amounts of incoming environmental data.

The Developmental Stage Model

Based initially on the work of Jean Piaget, the developmental model hypothesizes that intelligence consists of cognitive mental structures that control an individual's passage through discrete and qualitatively distinct developmental stages. According to this view, the thinking of individuals follows a single route of intellectual development, changing from concrete to abstract and from specific to general. This route consists of stages that adhere to an invariant sequence in which the cognitive structures are modified to reflect the assimilation and accommodation of new aspects of the perceived environment.

Often called the "constructivist" model, developmental theory offers a view of learning that centers on how the learner constructs understandings and concepts about the objects and events in the perceived environment. It is assumed that learning results from five variables: the influence of maturation, mental structures that produce insight and learning, experiences with the environment, experiences with others, and self-regulation processes. In addition, learning is viewed as occurring in invariant developmental stages with each stage being dependent on the preceding stages. Unlike the factorial model, in which differences among humans are viewed as substantive differences in mental components, individual differences are viewed as failures to pass through higher stages of cognitive development.

Instructional interventions are designed to provide the learner with an academic environment in which there is a "match" between the content complexity and the stage at which the learner is functioning (Lowery, 1985). The instructional goal is to help students move to higher levels of abstraction and symbolism. Instruction based on the developmental model provides experiences for students to progress through academic tasks that increase in cognitive complexity. Students are assigned to cognitively appropriate activities and are not placed at higher levels for which they are not developmentally ready. Initial tasks require students to observe, to seriate, and to make collections. Later tasks require students to use conditional reasoning, to understand various perspectives, to evaluate, and to extrapolate.

One collegiate application is the "Learning Cycle" used at the University of Nebraska (Campbell, Fuller, Thornton, Peterson, Carpenter, & Narveson, 1980). Based on the early work of Karplus (1974), the program is called "ADAPT" (Accent on the Development of Abstract Processes of Thought). Students engage in a hierarchical set of activities that emphasize exploration, invention, and application. Initially, students are limited to gathering information about specific aspects of the topic. They then generalize from these concrete experiences some principles and concepts that extend beyond the scope of the topic. Finally, they apply these principles to a new context.

The Heuristic Model

Unlike the factorial and developmental models, the heuristic model is not the product of a theory of intelligence. That is, the instructional focus on generic strategies of problem solving is not extrapolated from theoretical notions about the mental structures (defective or not) that underlie thinking and learning. Rather, the emphasis is on generic strategies for identifying and solving problems and teaching them to students who will then use them in other more academic pursuits.

Some strategies are taught with problem solving activities, while others use logic, reasoning, rhetorical, and philosophical activities. Both kinds of activities, however, require students to focus on conceptualizing, representing, and planning in problem solving by representing the problem with a diagram, by restating or reformulating the problem, and by breaking the problem into smaller parts. The heuristic instructional programs are not often integrated with academic content. Rather, they are usually designed to be a supplemental addition to the curriculum. The infrastructure of programs, however, may be organized around a theme or the context of a story.

The heuristic model is the theoretical basis for the majority of instructional programs used in schools and universities. Some examples are those programs such as CoRT (deBono, 1983), Productive Thinking (Covington, Crutchfield, Davies, & Olton, 1974), Philosophy for Children (Lipman & Sharp, 1977; Lipman, Sharp, & Oscanyan, 1980), IDEAL (Bransford, 1984; Bransford & Stein, 1984), and the abundance of college courses that teach logic, reasoning, and study strategies (for example, Bender, 1987; Copi, 1978; Dansereau, 1985, 1988;

Hendrickson, 1984; Lazere, 1982; Miller, 1986; Neimark, 1984; Rubenstein, 1975; Simpson, 1986; Weinstein & Mayer, 1986; Weinstein & Underwood, 1985).

The Taxonomic Model

The taxonomic model, like the heuristic model, is not the product of a theory of intelligence because of the absence of focus on cognitive structures that underlie intelligence. It is, rather, a convenient label for an instructional perspective that focuses on a hierarchy of hypothesized skills associated with thinking and learning. The skills are considered to characterize critical thought and, taken as a group, are those that underlie successful learning. The Bloom (1956) taxonomy is perhaps the most common of the hierarchies. The assumption is that learning consists of a linear progression from simple cognitive processes to those that are more complex. Tasks are designed to follow this hierarchical continuum of simple to complex: instruction is sequenced, the skills are separated and presented in discrete units of study, and exposure is limited to a few skills at each level.

Activities are designed to foster specifically described thinking skills so that students may become better learners and derive more success from academic settings. There may be no hierarchical relationship among the activities, nor a context that organizes and structures the activities taken as a whole (as in the heuristic programs that are organized by the context of a story or series of related problems).

Some of the taxonomic programs minimize an emphasis on subject matter found in academic programs, while others use some course content as a vehicle for the teaching of the skills. In both types of programs, however, the focus is on the teaching of thinking skills as the educational discipline, not the learning and application of academic content. Students are given specific instruction in how and when to employ these skills. Accordingly, they engage in increasingly complex activities that are loosely grouped according to the specific thinking skill being taught. The paper and pencil tasks often involve analogies, recognizing errors in reasoning, propaganda recognition, recognizing probability of truth and falsity, imagery manipulation, model building, mapping structures, defining problems, studying relationships, and organizing data.

One instructional example based on the taxonomic model is Strategic Reasoning (Glade & Citron, 1983). The academically separate program consists of a set of six categories of paper and pencil activities to be taught for one period a week during the semester. The cognitive skills are:

1. Thing-making: perceiving individual things through their names, symbols, and images;
2. Qualification: analyzing the characteristics of things;
3. Classification: grouping things;
4. Structure analysis: analyzing and creating part/whole relationships;
5. Operation analysis: putting things into sequential order;
6. Analogies: understanding analogous relationships.

Other examples include the instructional approaches of Byer (1984a, 1984b, 1985); Harnadek (1986); and Miles and Rauton (1985).

The Integrative Model

The integrative model is similar to the heuristic and taxonomic models in its lack of theoretical focus on the causal components of thinking and learning. It is distinct, however, in the pedogogical integration of the teaching of cognitive strategies along with subject matter. There is no attempt to view one as being more instrinsically important than the other. Rather, the idea is that students should not learn to use cognitive strategies in isolation from the academic context to which they are exposed. The instructional focus, then, is on teaching students to learn and apply the cognitive strategies that are indigenous to the content being taught. As a result, they theoretically experience a concomitant growth in the academic content for which they are held accountable.

Unlike the other four models, the integrative model is not associated with a commercial or programmed course of study. Rather, it is a theoretical perspective used by instructors as they design courses for their students. In the context of the subject matter being taught, the students learn to use specific strategies applicable to the content of their academic courses. Some of these strategies include: networking, making graphic representations, using mnemonics, decomposing, paraphrasing, outlining, semantic mapping, self-talk, and imaging.

This theoretical perspective is found in many of the instructional paradigms that appear in the literature. The Taba (1965) approach, as described by Seiger-Ehrenberg (1985), for example, teaches students to organize facts into conceptual systems, relating points in data to each other and generalizing into relationships that structure the learning of other related concepts. A similar cognitive approach (Marzano & Arredondo, 1986) explicitly teaches students the strategic procedures for 22 cognitive operations divided into learning-to-learn skills, content thinking skills, and reasoning skills. Other collegiate applications are those reported by King, Stahl, and Brozo, (1984); Meyers (1987); Miles (1988); and Weinstein, Goetz, and Alexander (1988).

The Ausubel (Joyce & Weil, 1986) system of advanced organizers is a three-phase integrative system often used in the social sciences. Teachers first present students with introductory material to help them explain, integrate, and interrelate the new material with previously learned concepts, terms, propositions, illustrations, and analogies. Students are then presented with the learning task and materials that are integrated with previous learning. Finally, students develop principles that generalize to new contexts. A similar approach often associated with the natural sciences, is Suchman's (Joyce & Weil, 1986) Inquiry Training. Teachers present a discrepant problem situation or occurrence and let students hypothesize, predict, experiment, explain, and construct principles to be applied in subsequent investigations.

A Selected Critique of Models

These five theoretical perspectives and their concomitant instructional interventions have made important contributions to developmental education, and they offer developmental educators a variety of approaches and instructional frameworks. Their collective foci are on the intrinsic cognitive and behavioral characteristics associated with the learner as the primary variable in an instructional environment. Concomitantly, when there are academic problems, the theoretical, diagnostic, and pedagogical emphases are placed on the manipulation and modification of those cognitive learner characteristics assumed to be the etiological contributors.

It is this exclusionary and often isolated focus on learner variables, however, that requires a cautionary approach to the broad applicability of these models in the variety of educational contexts that characterize developmental education. For example, the factorial model is limited by assessment measures that often fail to recognize the influence of affective, motivational, and experiential factors as components of the construct called intelligence (Shaha & Wittrock, 1983; Sternberg, 1985; Wagner & Sternberg, 1984). Additionally, instruction based on the factorial model has failed to produce evidence of transfer to new information and unrelated contexts (Savell, Twohig, & Rachford, 1986).

Other pedagogical and theoretical aspects of the models may indicate the need for instructional caution. According to Norris (1985b), most of the empirical research on cognitively oriented instructional approaches has been poorly designed in that most studies lack control groups with which to make meaningful comparisons. Moreover, little evidence has been supplied to indicate that instructional approaches clearly lead to better thinking or to any long-term positive cognitive benefits.

An additional caveat is the failure of many of the cognitive strategies and problem solving procedures to integrate with and generalize to academic tasks (Chance, 1986; Miles, 1988; Nickerson, 1984a, 1984b; Nickerson, Perkins, & Smith, 1985; Norris, 1985a; Resnick, 1987; Sternberg, 1986b). One reason for this lack of transfer may be the simplistic and tenuous assumption that critical thought and problem solving can be taught as a set of discrete skills anchored in general knowledge and isolated from the formal domains of knowledge taught in institutional courses. According to Cuban (1985), instructional interventions that emphasize discrete skills and strategic processes are but simplistic and mechanistic exercises that fail to recognize the complex nature of human learning.

Applications to Developmental Education

Of the five models, the Integrative may provide developmental educators with a theoretical and philosophical framework that can be broadened to accommodate for learning as a complex human endeavor that encompasses many variables, not just those directly associated with the learner. This perspective offers not only a focus on cognitive strategies that are indigenously useful in a variety of knowledge domains, but also a consideration of other interactive relational variables between learners, their instructors, the cognitive and representational nature of the tasks, and the linguistic structures of the course materials.

Not surprisingly, this view of learning and learning environments has yet to be codified into a manageable body of theoretical and empirical literature. Rather, interested readers must wade through a broad base of cognitive and sociolinguistic literature that often suffers from some of the theoretical and research inadequacies associated with the models presented in this discussion.

Notwithstanding this initial caveat, a framework for relating these cognitive and environmental variables into a manageable framework is to analyze the degree of "match" between any two variables. One such pairing is that between students and textual materials. Recent socio-psycholinguistic research has explored a number of interactive linguistic variables thought to account for comprehension difficulties encountered by students and text complexity. Some of these variables are surface, interpretive, and systematic complexities (Smith, 1988); syntactic, lexical, and semantic variables (Frazier, 1988); writing style, reader experiences and familiarity with text vocabulary, text organization, and structure of prose (Anderson & Davison, 1988); and reader's preexisting world knowledge and goals of reading (Baker, Atwood, & Duffy, 1988).

An important contribution of this research is the recognition of the critical influence of many textual linguistic variables on the reading comprehension of students. Rather than view students who experience severe difficulty with reading comprehension as a qualitatively different subgroup, Anderson and Armbruster (1984), for example, point to linguistic variables that structure to the text as potential causal contributors. "Considerate" texts (those that lend themselves to comprehension) can be distinguished from "inconsiderate" texts when they are well-signaled with cue words, when they have conceptual and structural cohesion and organization, when the genre chosen fits the author's purpose, and when the content and vocabulary is appropriate for the intended audience. Similarly, Jones, Palincsar, Ogle, and Carr (1987), and Estes (1988), have concluded that inconsiderate texts should be considered a major reason for comprehension failures. Other work in this area has been conducted by Kemper (1988) and Tierney and Mosenthal (1982).

The contribution of text analysis research is an important addition to the understanding of the interactive relationships between students and the textual materials that are assigned to them. Developmental students are often characterized by their problematic experiences with written texts. Instructors, therefore, who are sensitive to the linguistic and cognitive variables that contribute to students' successes and failures with texts can design instructional interventions that will promote enhanced cognitive and academic growth of students.

Another pairing of variables consists of those between students and tasks, that is, the cognitive strategies invested by the student and those required by the tasks. A match occurs when the student recognizes the varying kinds of cognitive strategies and "matches" the appropriate strategy with the cognitive nature of the task. Some tasks, for example, require

strategies of rehearsal and rote memory, while others require more cognitively complex strategies of elaboration, organization, and comprehension monitoring (Weinstein & Mayer, 1986). Accordingly, "mismatch" can occur when the student fails to select and use the appropriate cognitive strategy required by the task. The focus, then, is on the relationships *between* students and the nature of the task rather than on the student as the isolated and discrete variable.

Other examples of relationships between students and tasks are found in the works of Blais (1988), Derry and Murphy (1986), Perry (1981), and Tenneyson and Cocchiarella (1986). Additional research on the relationships between students and teaching strategies can be found in the work of Anderson (1987); Haroutunian-Gordon (1988); Howard (1987); Jones, Tinzmann, Friedman, and Walker (1987); Nussbaum (1981); Park (1984); Patten, Chao, and Reigeluth (1986); and Resnick (1984).

In summary, the Integrative model provides developmental educators with a conceptual framework with which to unravel the complexity of relationships among students, teachers, texts, and tasks. Rather than view the instructional environment through a narrow lens that exposes only those intrinsic characteristics associated with students, educators can broaden their perspectives to a view that permits an accounting for all of the variables that are influencing the degree of success experienced by students.

The design of educational interventions for developmental students is a complex and often frustrating undertaking. It is because of this complexity, however, that developmental educators must adopt a cautionary view of simplistic instructional systems that promise more than they can deliver. The power to design instruction lies within the expertise of the educator. And that expertise is gained through the development and extensive use of robust theoretical tools that explain, predict, and generate educational practice that accommodates all the variables associated with learning.

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M. Jan Mickler is Coordinator of Reading Services at the University of Tennessee at Chattanooga

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Affective and Cognitive Features of Collaborative Learning

by Kate E. Sandberg

Gradually, collaborative learning and its counterpart, cooperative learning, are entering the college classroom. Although from vastly different origins, both theories stress small-group members' interdependence to attain a goal. If a teacher plans well, students in this situation will enhance their motivation and involvement in course work, strengthen their self-esteem and interpersonal relationships, and gain higher order cognitive and metacognitive skills—each of these attainments being advantageous to underprepared college students. This article outlines collaborative and cooperative learning theory, integrates the two theories to present a successful model for practice, and analyzes the affective and cognitive benefits of the model.

Collaborative and Cooperative Learning Theory

Collaborative learning's chief advocate is Kenneth A. Bruffee, professor of English at Brooklyn College. He has written extensively about collaborative learning theory to convince theorists and teachers of the benefits of this type of learning. According to Bruffee (1982), small groups of students in the classroom are, in fact, "communities of peers." These communities of peers provide students with a mechanism for understanding "how knowledge is generated, how it changes and grows" (1984, p. 646). This perspective on the establishment and maintenance of knowledge and belief is called social constructionism. Bruffee says of social constructionism, "The view that conversation and thought are causally related assumes not that thought is an essential attribute of the human mind but that it is instead an artifact created by social interaction" (1984, p. 640).

Bruffee (1982, 1984, 1986)draws from such diverse sources as Kuhn's *The Structure of Scientific Revolutions*, Vygotsky's *Mind in Society*, Rorty's *Philosophy and the Mirror of Nature*, anthropologist Geertz's *Local Knowledge*, and literary theorist Stanley Fish to explore social constructionism and its role in the college classroom. Most other American writers who explain or analyze collaborative learning use Bruffee as the basis for their theory; he is the touchstone for collaborative learning theory in this country.

While the theory of collaborative learning appears well established, the practice of it is not. The literature reveals a lack of agreement as to its general practice for learning in the classroom. When conditions for use are addressed in journal articles, authors appear to have little agreement and no empirical data on the most productive methods. Accordingly, the unique approach of each article in a recent publication from the Committee on Classroom Practices, National Council of Teachers of English, *Focus on Collaborative Learning* (1988), exemplifies the lack of sure parameters and definitions of practice. The 23 authors vastly differ as to the structure, the proposed benefits, and the role of the teacher in a collaborative learning experience.

Whereas collaborative learning has primarily affected college and high school English classes, cooperative learning has made an enormous impact in elementary and junior high schools. Cooperative learning theory draws directly from social psychology (Johnson & Johnson, 1987, p. 17). Morton Deutsch, a social psychologist, has explicated cooperation's value over competition and its determinants for success (1962). Roger and David Johnson (Johnson, Johnson, Holebec, & Roy, 1984) have carried Deutsch's work further by extensively researching social skills, power structures, controversy, productivity, and actual learning of students in small groups. The Johnsons' work has inspired countless journal articles and doctoral dissertations predominantly directed toward elementary and secondary children. Other well-known cooperative learning theorists such as Slavin (1983, 1988), Aronson (1978), and Sharan and Hertz-Lazarowitz (1980) have done a considerable amount of research but, again, with elementary children. However, the postsecondary literature on cooperative learning theory is sparse.

Cooperative learning theorists have developed commonly accepted conditions for practice. These conditions vary slightly from theorist to theorist, but their essence remains the same. The Johnsons and their associates postulate four general guidelines for successful practice: positive interdependence among group members, face-to-face interaction, individual accountability, and appropriate use of social skills (Johnson et al., 1984). Robert E. Slavin gives variations of these conditions in his book, *Cooperative Learning* (1983). Recently, Slavin (1988) stressed the paramount importance of two conditions for achievement gains: individual accountability and group goals. Aronson (1978) and Sharan and Hertz-Lazarowitz (1980) have come to the same general conclusions. Therefore, cooperative learning has clear parameters for theory and practice.

An Integrated Model

If a teacher integrates the strongest elements from both collaborative and cooperative learning, a dynamic model, especially applicable to developmental students, emerges. For simplicity's

sake, this integrated model will be called collaborative learning. In order to accomplish the integrated model's goals of consistent affective and cognitive growth in a social context, the teacher needs to incorporate six conditions into the instructional plans:

Group member positive interdependence—This critical condition happens only when the teacher carefully designs a goal for the group (two to six members) which mandates each person's total participation. The positive affective dimensions of trust, cohesiveness, and tolerance of points of view other than one's own (Deutsch, 1962; Johnson et al., 1984; Slavin, 1983; Winston, Bonney, Miller, & Dagney, 1988; Wlodkowski, 1985) as well as academic achievement (Slavin, 1983, 1988) occur when members realize they all need each other's help to reach the goal.

Group goal—All major researchers and theorists of both cooperative and collaborative learning agree that the group goal must be a consensual goal (Bruffee, 1985; Johnson et al., 1984; Johnson & Johnson, 1988; Sharan & Hertz-Lazarowitz, 1980; Slavin, 1983, 1988). In other words, all the members must agree to the final result. It is the process of coping with points of view other than one's own and reaching a consensus of those points of view which affects cognitive development so often wanting in underprepared students.

Social skills—Students need to know how to function well in a small group. Some important skills to acquire are how to listen, negotiate, share, lead, follow, and take responsibility (Bruffee, 1984, 1985; Deutsch, 1962; Johnson & Johnson, 1987; Johnson et al., 1984; Slavin, 1983; Winston et al., 1988; Wlodkowski, 1985). A teacher cannot assume students have these skills when they enter the college classroom because traditional lecture courses psychologically and physically isolate students. Hence, social skills must be incorporated into the instruction.

Briefing and debriefing with entire class—Before a learning experience, competent teachers brief students as to the goal, how to get it, and why. Debriefing after the experience is just as important. The teacher debriefs with three questions: What happened? How does it feel? What does it mean? (Pearson & Smith, 1985). These three questions help the learner understand the chronology of the experience, the emotions involved, and the significance of the experience. This in turn fosters affective and cognitive development. The debriefing questions also provide closure during the termination stage of group development (Winston et al., 1988).

Individual accountability—Slavin (1988) and Johnson et al. (1984) consider this condition essential for student success in cooperative learning. Group members must understand that they are individually responsible for learning from various sources: the text, the group, the teacher, and other assigned resources. This accountability may be a test, a paper, an oral interview, or any other form which shows individual progress.

Group rewards—This condition is related to the group goal and positive interdependence but needs a special category. When the group anticipates a specific reward based on all the members' learning, the instructional effectiveness of the learning is increased (Slavin, 1983, p. 32). Potential recognition of the group effort unites the members psychologically while they work toward the goal. Group presentations, bonus points for improvement, and recognition by the teacher and class members are group rewards.

These five conditions do not assure the success of collaborative learning. Other variables such as group composition, allotted time, teacher attitudes, perceived quality of the goal, and past experiences of the students enter into the exciting challenge of reaching students whose academic and operational skills are not sufficient to engage in largely independent learning.

Affective and Cognitive Benefits

Especially for the underprepared student, the integrated model reaps affective and cognitive benefits which far outweigh the uncertainty and adjustment which come with any new mode of instruction.

Affective Benefits

By virtue of the social context, the group goal, and the semi-independence of each group, affective growth in collaborative learning situations develops differently than in the traditional classroom. These three characteristics do not exist in classrooms in which the teacher delivers knowledge to silent students. Therefore, collaborative learning enhances student motivation, academic involvement, self-esteem, and interpersonal relations in a manner unavailable to lecture-based learning.

Solving problems in the social context of small groups forms the basis of adults' work and personal lives, e.g., families, businesses, and friendships. The problems or issues in a student's life are usually solved by seeking and listening to advice, considering it, and coming to some conclusion. If students realize the direct applicability of classroom small-group problem-solving to their own lives, motivation to learn will show a marked increase (Wlodkowski, 1985, p. 198).

Beyond their motivational factors of relevance to "real life," group goals can be more complex and, therefore, more interesting than individual student goals. This condition, in turn, stimulates academic involvement (Resnick, 1987, p. 41). These problems or issues are not complex for the sake of complexity; the intent is to have the multi-faceted problem reflect more accurately the intricacy of reality (Paul, 1984).

With collaborative learning, students not only learn the complexities of true problems, but they have both the emotional and the academic support of peers while they do it. This peer sustenance is missing in the traditional lecture courses that often prove to be unrewarding for students lower on the developmental ladder. Current research suggests that high-risk students, particularly returning women (Belenky, Clinchy, Goldberger, & Tarule, 1986), best develop affectively and cognitively with support of peers (Brookfield, 1987, p. 232; Johnson et al., 1984; Resnick, 1987; Slavin, 1983, 1988).

Another important affective benefit of collaborative learning is students' enhanced self-esteem. Considerable evidence shows a collaborative environment will elevate a person's feelings of self-worth more than a competitive one (Aronson, 1978; Belenky et al., 1986; Johnson et al., 1984; Johnson & Johnson 1987; Slavin, 1983). Each group member fulfills an important and unique role in the collaborative process. Also the teacher is no longer the focus of the classroom; students must rely primarily on themselves and peers to solve the problem. Resnick (1987) says, "Through this process, students come to think of themselves as capable of engaging in independent thinking and of exercising control over their learning processes." These metacognitive factors contribute to the realization that the teacher is not the only person with valued knowledge and to conditions that assure students that their collective experiences and knowledge have acknowledged worth.

Slavin (1983) and Aronson (1978) dramatically demonstrated interpersonal and interracial relationship improvements with cooperative learning. Because of the heterogeneous composition of the groups, students in their study had to deal in an interdependent manner with people from different backgrounds than their own. Although artificial, the situation created circumstances which fostered face-to-face contact and understanding of background and values. This learning environment can be replicated in the college classroom where, otherwise, students may have no chance to change their perceptions of people unlike themselves. Collaborative learning gives them the chance.

Cognitive Benefits

Cognitive benefits of collaborative learning revolve chiefly around listening to disparate perspectives on a problem and mutually blending those perspectives into a consensus. Two facets of cognitive development are likely to occur with the proposed model: cognitive dissonance and schemata restructure.

Certainly, the model creates cognitive dissonance (Festinger, 1957). It is designed to force dissonance or challenge current opinions and attitudes (Johnson & Johnson, 1988). Students must not only evaluate their own perspectives, but they must also evaluate their peers' perspectives as well. Paul (1984), a philosopher, and Basseches (1986), a cognitive psychologist, name this type of learning "dialectical thinking." Basseches states:

> To think dialectically, is, in a certain sense, to trade a degree of intellectual security for a freedom from intellectually imposing limitations on oneself or other people. The open-mindedness which is thus gained is extremely important from the perspective of concern with cognitive development because it facilitates the joining in collective meaning-making efforts with others whose reasoning is shaped by very different world views or life contexts. (p. 40)

As students deal with the dissonance, they "think aloud" among themselves. This creates a student's norm of analyzing and evaluating their own and others' ideas (Resnick, 1987). Students give each other permission to challenge ideas because of the interdependence of members, the consensual nature of the goal, the learned social skills, and the potential group reward (Johnson & Johnson, 1988). At the same time, the affective dimensions of collaborative learning (enhancement of self-esteem, involvement, motivation) encourage the student to take cognitive risks and to explore new avenues of learning that provide alternatives.

The collaborative learning model attempts to resolve the dissonance by requiring a consensual group solution. Each member will have invested time, ego, emotions, and knowledge into the experience. Hence, the individual members will restructure cognitive frameworks or schemata (Basseches, 1986) relative to the consensus. Unfortunately, the empirical research on adult cognitive development in social contexts is almost nonexistent. Resnick says, "On the whole, research on the development of cognitive abilities has proceeded quite separately from research on social and personality development" (1987, p. 42). With the exception of Basseches' small study (1986), evidence of schematic cognitive development in collaborative situations is not available.

However, the previously discussed research evidencing improvement in the affective domain clearly demonstrates that collaborative learning creates a more encouraging environment for cognitive development of underprepared students than traditional lecture courses. This is especially true because students have peer support for intellectual questioning which encourages habits or dispositions to higher order thinking (Resnick, 1987). According to Resnick, "We have good reason to believe that shaping this disposition to critical thought is central to developing higher order cognitive abilities in students" (p. 41). Further, as research results accumulate, collaborative learning is expected to reveal students' enhanced cognitive growth.

Summary

Collaborative learning is not meant for all teachers in all learning situations. However, current research suggests social contexts, specifically the integrated model of collaborative and cooperative learning presented here, brings students together in an interdependent manner to produce significant affective and cognitive benefits. Further research on developmental students in collaborative settings awaits the interested scholar.

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Kate Sandberg teaches reading, thinking, and learning skills courses at the University of Alaska-Anchorage, 3211 Providence Drive, Anchorage, AK 99508.

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